



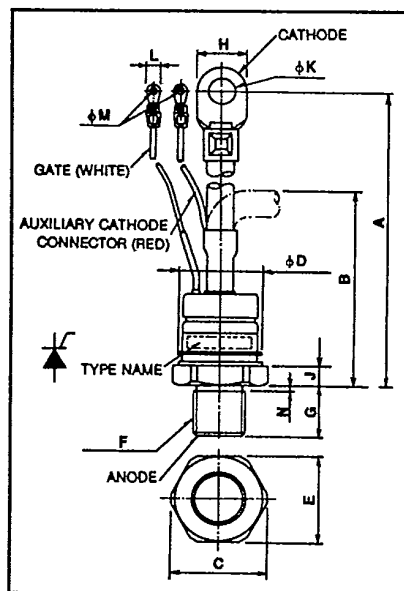
T-25-19

**CR400EL**

Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272  
 Powerex Europe, S.A., 428 Ave. G. Durand, BP107, 72003 LeMans, France (43) 72.75.15

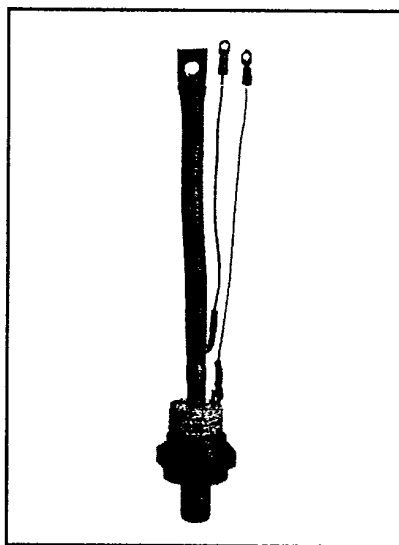
**Phase Control SCR**

**400 Amperes Avg**  
**200-1200 Volts**



**CR400EL**  
**Outline Drawing**

| Dimensions | Inches     | Metric    |
|------------|------------|-----------|
| A          | 9.06 ± .30 | 230 ± 8   |
| B          | 4.53 Max   | 115 Max   |
| C          | 1.77       | 45        |
| φD         | 1.614 Max  | 41 Max    |
| E          | 1.62       | 41        |
| F          | M24        | M24 × 1.5 |
| G          | .95        | 24        |
| H          | .87        | 22        |
| J          | .43        | 11        |
| φK         | .413       | 10.5      |
| L          | .32        | 8         |
| φM         | .173       | 4.4       |
| N          | .13        | 3.3       |



**CR400EL**  
**Phase Control SCR**  
 400 Amperes/200-1200 Volts

**Description**

Powerex Silicon Controlled Rectifiers (SCR) are designed for phase control applications. These are all-diffused, compression bonded encapsulated (CBE) devices employing the field-proven amplifying (di/namic) gate.

**Features:**

- ☐ Low On-State Voltage
- ☐ High di/dt
- ☐ High dv/dt
- ☐ Hermetic Packaging
- ☐ Excellent Surge and I<sup>2</sup>t Ratings

**Applications:**

- ☐ Power Supplies
- ☐ Battery Chargers
- ☐ Motor Control
- ☐ Light Dimmers
- ☐ VAR Generators

**Ordering Information**

Example: Select the complete eight or nine digit part number you desire from the table – i.e. CR400EL-12 is a 600 Volt, 400 Ampere Phase Control SCR.

| Type    | Voltage                              |      | Current |
|---------|--------------------------------------|------|---------|
|         | V <sub>ORM</sub><br>V <sub>RRM</sub> | Code |         |
| CR400EL | 200                                  | -4   | 400     |
|         | 300                                  | -6   |         |
|         | 400                                  | -8   |         |
|         | 500                                  | -10  |         |
|         | 600                                  | -12  |         |
|         | 800                                  | -16  |         |
|         | 1000                                 | -20  |         |
|         | 1200                                 | -24  |         |



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**Absolute Maximum Ratings**

|                                                               | Symbol       | CR400EL           | Units              |
|---------------------------------------------------------------|--------------|-------------------|--------------------|
| RMS On-State Current                                          | $I_{T(RMS)}$ | 630               | Amperes            |
| Average On-State Current                                      | $I_{T(av)}$  | 400               | Amperes            |
| Peak One-Cycle Surge (Non Repetitive) On-State Current (60Hz) | $I_{TSM}$    | 8000              | Amperes            |
| Peak One-Cycle Surge (Non-Repetitive) On-State Current (50Hz) | $I_{TSM}$    | 7300              | Amperes            |
| Critical Rate-of-Rise of On-State Current (Non-Repetitive)    | $di/dt$      | 500               | Amperes/ $\mu s$   |
| Critical Rate-of-Rise of On-State Current (Repetitive)        | $di/dt$      | 200               | Amperes/ $\mu s$   |
| $I^2t$ (for Fusing), one cycle at 60Hz                        | $I^2t$       | $2.7 \times 10^5$ | A <sup>2</sup> sec |
| Peak Gate Power Dissipation                                   | $P_{GM}$     | 10                | Watts              |
| Average Gate Power Dissipation                                | $P_{G(av)}$  | 3                 | Watts              |
| Storage Temperature                                           | $T_{STG}$    | -40 to 150        | °C                 |
| Operating Temperature                                         | $T_J$        | -40 to 125        | °C                 |
| Mounting Torque <sup>①</sup>                                  |              | 390 to 520        | in.-lb.            |
| Mounting Torque <sup>①</sup>                                  |              | 450 to 600        | kg-cm              |

**Electrical and Thermal Characteristics**

| Characteristics                              | Symbol          | Test Conditions                             | CR400EL | Units        |
|----------------------------------------------|-----------------|---------------------------------------------|---------|--------------|
| <b>Voltage—Blocking State Maximums</b>       |                 |                                             |         |              |
| Forward Leakage, Peak                        | $I_{DRM}$       | $T_J = 125^\circ C, V_{DRM}$ applied        | 30      | mA           |
| Reverse Leakage, Peak                        | $I_{RRM}$       | $T_J = 125^\circ C, V_{RRM}$ applied        | 30      | mA           |
| <b>Current—Conducting State Maximums</b>     |                 |                                             |         |              |
| Peak On-State Voltage                        | $V_{TM}$        | $T_J = 125^\circ C, I_{TM} = 1250A$         | 1.70    | Volts        |
| <b>Switching</b>                             |                 |                                             |         |              |
| Min. Critical dv/dt exponential to $V_{DRM}$ | dv/dt           | $T_J = 125^\circ C, V_D = 1/2 V_{DRM}$      | 200     | V/ $\mu sec$ |
| <b>Thermal</b>                               |                 |                                             |         |              |
| Maximum Thermal Resistance <sup>①</sup>      |                 |                                             |         |              |
| Junction to Case                             | $R_{\theta JC}$ |                                             | .09     | °C/Watt      |
| Case to Sink, Lubricated                     | $R_{\theta CS}$ |                                             | .04     | °C/Watt      |
| <b>Gate—Maximum Parameters</b>               |                 |                                             |         |              |
| Gate Current to Trigger                      | $I_{GT}$        | $T_J = 25^\circ C, V_D = 6V, R_L = 2\Omega$ | 200     | mA           |
| Gate Voltage to Trigger                      | $V_{GT}$        | $T_J = 25^\circ C, V_D = 6V, R_L = 2\Omega$ | 2.5     | Volts        |
| Non-Triggering Gate Voltage                  | $V_{GDM}$       | $T_J = 125^\circ C, V_D = 1/2 V_{DRM}$      | .20     | Volts        |
| Peak Forward Gate Current                    | $I_{GTM}$       |                                             | 4.0     | Amperes      |
| Peak Reverse Gate Voltage                    | $V_{GRM}$       |                                             | 4.0     | Volts        |

① Consult recommended mounting procedures.



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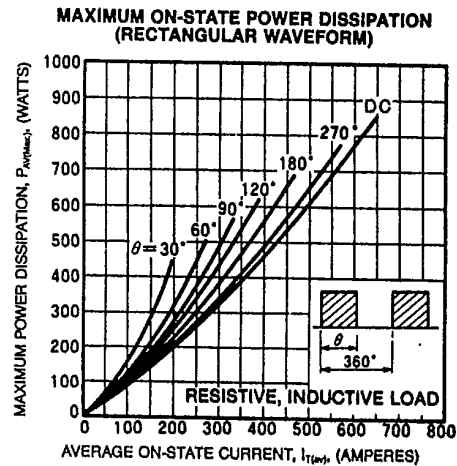
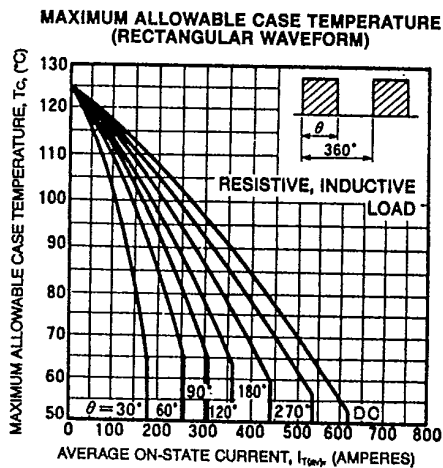
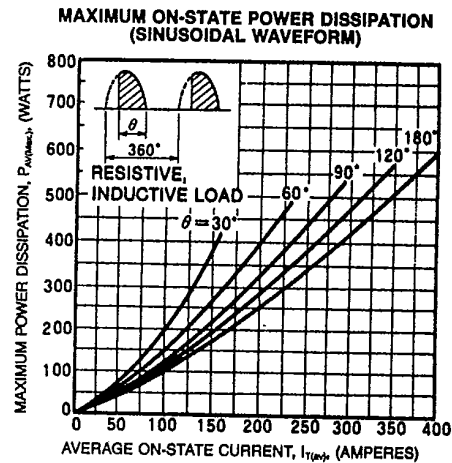
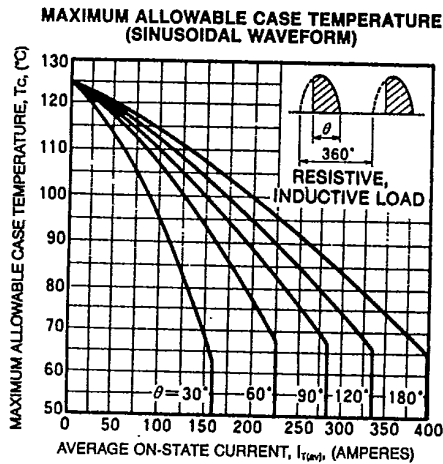
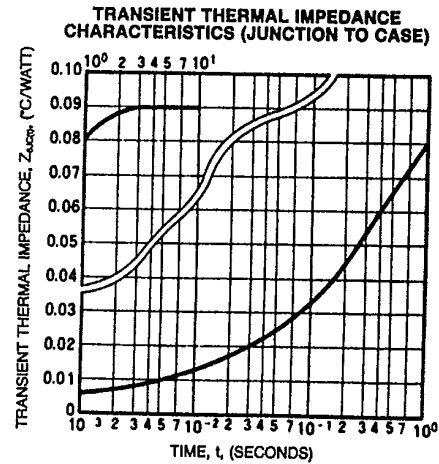
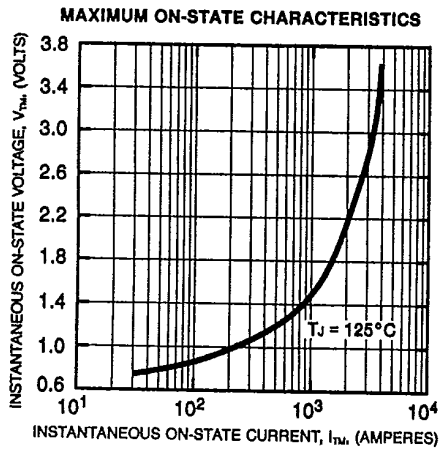
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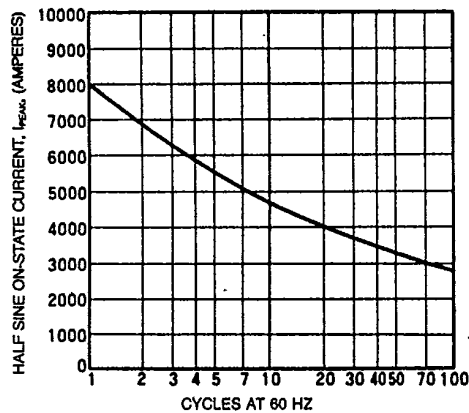
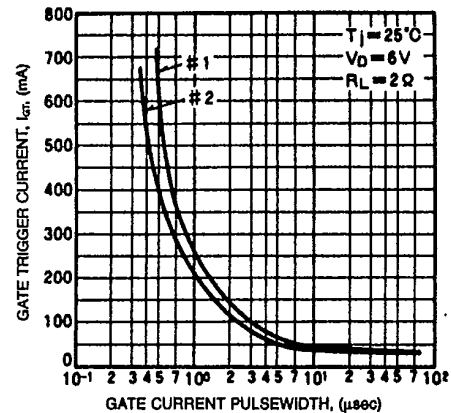
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**MAXIMUM ALLOWABLE SURGE ON-STATE CURRENT (NON-REPETITIVE)****GATE TRIGGER CURRENT VS. PULSEWIDTH (TYPICAL)****GATE CHARACTERISTICS**